Smart Beta Modelling:
The Case for Cyclically Adjusted Price/Earnings Ratios

Nick Jacobs & Dan Wollenberg
Advisors: Dr. Robert Dean and Dr. Tony Caporale

- **Study Purpose**
  - Determine if portfolio weights, based on Cyclically Adjusted Price/Earnings Ratios (CAPE), can generate excess returns (Alpha) over the market
- **Research Design**
  - Weighting Factor: CAPE Ratios
  - Weighting Strategy: Higher weights given to stocks with higher CAPE ratios
  - Test Universe: Top ten stocks by markets value for the following sectors: XLY, XLS, XLI, XLH, XLK
  - Performance Period: 2010-2016
- **Model Construction:**
  1. **CMEPSi=[EPSi(t-4)/CPI+EPSi(t-3)/CPI+EPSi(t-2)/CPI+EPSi(t-1)/CPI+EPSi(t)/CPI]/N=5**
  2. **CAPEi(t)=Pi(t)/CMEPSi(t)**
  3. **Wi(t)=CAPEi(t)/∑CAPEi(t)**
  4. **Di(t)=Wi(t) X 1,000,000**
  5. **SHRi(t)=Di(t)/Pi(t)**
  6. **MVi(t+1)=SHRi(t) X Pi(t+1)**
  7. **Pv(t+1)=∑MVi(t+1)**
  8. **Second Interation**
- **Terms:**
  1. MEPS= 5Yr ma
  2. EPS= Earnings Per Share
  3. CPI=Consumer Price Index
  4. Wi=Portfolio Weight
  5. Di=Dollars Invested
  6. MV=Market Value
  7. PV=Portfolio Value
  8. i=ith stock (1-20)
  9. t=Time in Years
  10. CAPE= Cyclically Adjusted P/E Ratio

Table 1
Cumulative Returns
2012-2016

Sector	CAPE Model	SPY	Model Alpha
XLY	359%	62.18%	296.54%
XLP	108%	62.18%	45.53%
XLI	101%	62.18%	38.48%
XLV	136%	62.18%	73.85%
XLK	167%	62.18%	104.73%

Green = Model Outperformance

Table 2
Annual Returns

Year	XLY	XLP	XLI	XLV	XLK	SPY
2012	28.79%	7.16%	8.35%	19.09%	6.80%	13.40%
2013	66.69%	28.74%	38.90%	57.52%	44.93%	29.69%
2014	9.67%	22.89%	15.26%	24.80%	27.68%	11.29%
2015	45.24%	18.48%	-2.08%	9.59%	21.64%	-0.81%
2016	10.45%	3.41%	18.13%	-8.00%	11.03%	9.64%

Green = Sector Outperformance

- **Conclusion:**
  - Cumulative Returns: CAPE Model Outperforms SPY For All Sectors
  - Annual Returns: CAPE Model Outperforms SPY in majority of years for sectors XLY, XLI, XLV, and XLK